

## THE TREATMENT OF THE SYPHILITIC LIVER AND HEART: A THERAPEUTIC PARADOX.

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THERE is no field of organic disease in which a prognosis under known given conditions is more difficult than in certain forms of visceral syphilis. While syphilitic infection, both acquired and hereditary, affects every viscus, there are two forms of visceral involvement which stand out, by reason of enormous relative frequency, to all others. These are the various forms of hepatic and cardiovascular syphilitic disease. Take away these two great incidents in the sequelæ of constitutional syphilis and the remaining clinical pictures of visceral luetic disease would play a relatively small part in clinical pathology and practice.

It is an accepted fact, and one which makes the whole problem of the diagnosis and treatment of visceral syphilis more difficult, that extensive disease may exist without any clinical manifestations. How common, indeed, is it to find at the post mortem in those dead from old age, accidents or from other causes, the evidence of syphilis in either liver or heart, or both, sufficient, apparently, to have caused marked clinical symptoms from their extensive pathology, unsuspected during life and revealed only at the necropsy. On the other hand how frequent is it to find serious disease with marked symptoms and relatively insignificant changes in the viscera at the post mortem. Prognosis, therefore, cannot be estimated except in a very general way by the apparent extent of damage which is manifest.

Viewing both the syphilitic liver and the syphilitic heart in their various phases as distinct entities, the therapeutic problem connected therewith is made increasingly difficult and more delicate, by the fact that under given like conditions no two cases can be accurately estimated with regard to prognosis.

The tremendous accession to our knowledge of the clinical pathology of syphilis during the last decade may be attributed to three distinct factors: The discovery of the parasite, the employment of the complement-fixation test to diagnosis and the introduction of arsenic compounds as specific therapeutic agents. An enormous awakening of interest in the whole problem of syphilis dates itself from the almost simultaneous appearance in medical practice of these important discoveries. The clinical pathology of syphilitic infection was broadened to include pictures which hitherto were accepted as either possibly being associated with syphilis or in some cases in no way connected with it. In no field of medicine have the boundaries of our knowledge been

extended further than in the newer conception of the syphilitic pathology of the heart and liver.

It is difficult to say that the clinical incidence of syphilitic hepatitis and cardiac disease is more frequent today than before, and their apparent greater occurrence, as well as the manifestations of neurosyphilis, is assuredly explainable upon the basis of more careful examination and the greater inclusion into syphilitic pathology of the various functional and organic diseases of these organs.

It may perhaps be recalled that with the introduction of the original salvarsan preparation, it was distinctly stated in the directions concerning its administration, that cardiac disease and other visceropathies constituted a contraindication to the administration of the drug. Striking results, however, in all forms of syphilis have led to the gradual abandonment of this early precaution, and today it may be stated that the vast majority of syphilitic patients, including those with diseased hearts and livers, at some time or other receive intravenous arsenic medication, in many cases even to the exclusion of other forms of treatment. The great danger, anticipated perhaps by few, of the employment of anything approaching a specific lay in the possibility of the development of a routine or of a "rule-by-thumb" method of treatment. For the most part it may, I believe, be stated that cases now regarded as those of syphilis are treated more or less routinely. Less regard is given the patient as an individual and smaller consideration given to that particular form of the disease which might be predominant in the clinical pathology. To a great extent the dispensary and the hospital, the need of treating a large number of patients in a given time, may be held accountable for the marked tendency to routine rather than individual treatment.

My own experience, I must confess, has not been entirely free from a tendency in this direction, and together with most others it has up to within a short time been my custom to employ, at least some time during the course of the syphilitic's life, one or more courses of intravenous arsenic medication.

It is particularly to the employment of this form of medication in connection with cardiovascular and hepatic syphilis that I would direct attention. I have been impressed, in discussing with older clinicians and in reviewing the literature of pre-salvarsan days, with the fact that either cardiovascular and hepatic syphilis have materially changed in their prognostic outlook, or else they were more intelligently and better treated in pre-salvarsan days than they are today.

The first premise, namely, that the picture has materially changed, is hardly tenable. We are therefore confronted with the second, and it would be well to inquire a little further into the factors and reasons for this. At a day when we know infinitely more concerning the pathology of cardiac syphilis and syphilis of the liver

in their various phases, at a time when we are possessed of improved methods of treatment, it at first may seem strange that our patients have not benefited accordingly.

In regard first to liver syphilis: The incidence of this may be said to be second only in frequency to that of syphilis of the heart. Considering its frequent accidental finding at the postmortem, it is evident that its incidence is far higher than might be deduced from clinical experience.

At the outset it might be stated that great confusion exists in the correlation between the pathologic and the clinical pictures of liver syphilis. The pathologic status of the condition, moreover, is a confused and debatable field among pathologists. It may be accepted that syphilitic hepatitis is due on the one hand to true involvement of the parenchyma, and on the other to primary involvement of the bloodvessels with secondary changes in the parenchyma. Undoubtedly most cases combine both features. In the strictly parenchymatous involvement we may now distinguish early and late forms. The early form is manifested by mild jaundice, transitory and significant only in its possible bearing upon later involvement. The severe form leads to acute yellow atrophy (*icterus gravis syphiliticus*). Various types of late hepatic syphilis are described as pathologic entities which do not in fact have their clinical analogues. To attempt to differentiate these as clinical pictures leads to inevitable confusion. In the gross and microscopic anatomy of hepatic syphilis certain facts stand out which if recognized and emphasized would lead to a more clear understanding of the clinical phases of the disease.

Late liver syphilis is either diffuse or circumscribed. The diffuse form, consisting of multitudinous infiltrates or miliary gummas, leads to an interstitial fibrosis. The more circumscribed form, consisting of isolated infiltrates and larger gummas, leads spontaneously or under treatment to localized fibrosis. The end-result in either case is identical, a more or less cirrhotic liver. The combination of these two forms is certainly more common than is either one alone.

Reconstructing the pictures clinically, therefore, one may have a small atrophic liver, with or without ascites, and resembling the Laennec type, and a lobulated, either hypertrophic or atrophic liver, cirrhotic only in places, resulting from the circumscribed type. To this latter is given the name "*hepar lobatum*." The question of the size of the liver depends not so much upon the form of cirrhosis present as upon the time when the patient is seen. Hypertrophy may be seen early, to be followed later by atrophy, either spontaneous or under the influence of treatment. The clinical aspects in a given case depend upon the appearance in one case of tumor, and in the other of obstructive portal circulation leading to ascites, and the combination of these two pictures. There is no reason for a more

detailed description of the various symptoms which may or may not be present with syphilitic cirrhosis. These are familiar to all clinicians of experience.

There are certain mechanical factors present in these cases, however, which are of vital importance in the treatment and which affect the prognosis of a given case. The end-result of all syphilitic processes is a fibrosis. This fibrosis is materially hastened by energetic treatment. The process of repair in a parenchymatous organ in which fibrosis is going on depends upon its ability to recuperate by hypertrophy or by reproduction of its substance. The latter two functions are distinctly slow processes. Treatment, therefore, directed to a diseased organ in which the inevitable and ultimate result, both of the disease and of the treatment, is the production of a scar, should be of the type which leads to a slow rather than a rapid process of repair.

Brilliant results are occasionally achieved in one or the other type of syphilitic hepatitis by energetic and intensive treatment embodying the use of arsenic preparations. This cannot be denied. The consensus of opinion is that, compared with other forms of hepatic disease, syphilitic hepatitis has an admirable prognosis. I wish to concur in this view so far as it applies to the focal types, that is, gummosis hepatitis, *hepar lobatum* and to certain cases of the interstitial type. During the past ten years I have had a very unusual opportunity of studying many cases of hepatic syphilis in its various forms. Given equal conditions I have been struck with the great difference in the prognosis in the various cases of the same apparent type. From the standpoint of prognosis I find myself able to separate the cases broadly into three types: First, syphilitic cirrhosis in which gummosis tumors predominate. In a general way the prognosis of this condition stands out as the best of the three types. Second, combined gummosis involvement and extensive interstitial hepatitis. In this type as well as in the purely interstitial, non-gummosis type an apparent paradox in treatment occurs, particularly when such treatment is intensive. The patients improve with regard to their syphilis and get worse or die of their cirrhosis.

The apparent improvement which one may see in any case of visceral syphilis upon the institution of intensive treatment is not difficult to understand. The predominating clinical feature is but one phase of a widespread constitutional infection. A patient with hepatic syphilis, therefore, may feel decidedly better, his appetite returns, his vascular tone may be better, his color improve, and yet the predominating feature, the hepatic syphilis, may immediately become worse. I believe it may be stated that this is a general experience when the treatment is too intensive and when the process of repair is materially interfered with by the rapidity of connective-tissue replacement. It has been a

common occurrence in my experience for a patient with syphilitic hepatitis to develop his first ascites following the administration of salvarsan. Together with this there may be an intensification of the existing jaundice and a rapid disintegration of the liver, with increasing cachexia of the patient and early death by failure of metabolism. In the same type of case more conservative therapy in the form of mercury and iodide would have resulted in more gradual cicatrization, during which time compensatory hypertrophy might possibly have occurred in various unaffected portions of the organ. Portal obstruction might have been obviated and the patient's ultimate prognosis materially influenced for the better.

Another factor of extreme importance lies in the estimation of liver function. If it were possible by any accurate method to estimate the working capacity of this organ much might be learned with regard to what drug it could best tolerate. We must at this time be convinced of the fact that even to an apparently normal liver the administration of arsenic preparations is not without some danger. Indeed a particular type of jaundice, even in known non-syphilitic cases, can occasionally be produced, undoubtedly by the retention of arsenic in the liver, due possibly to preëxisting disease. With manifest lesions, therefore, in which one can with probability assume a marked degree of dysfunction, it becomes extremely hazardous to employ a substance which in itself may be said to be hepatotoxic, in attempting to alleviate the existing pathology. As an example of the effect of intensive régime embodying the use of arsenic preparations I beg to submit the brief histories of the following cases, which are typical of those of the class which I am describing and the study of which has led me to the above conclusions.

CASE I.—The patient, a man, aged thirty-three years, entered the hospital on June 13, 1919, complaining of swelling of the feet and legs and swelling of the abdomen. The syphilis was contracted fifteen years previously; treatment had been indifferent. One year previous to admission the onset of the disease appeared with a general anasarca. On examination he was found to be markedly emaciated and anemic, slightly jaundiced and to have an ascites and edema of the scrotum. The spleen and liver were both enormously enlarged, firm and hard, with no apparent indentations or nodes on the surface. There was no evidence of cardiac disease, but the lumbar puncture denoted associated cerebrospinal syphilis of the arterial type. In addition he had an old nasal perforation. This patient was given injections of salvarsan, six in number, with a most remarkable improvement in appetite and an improvement in his color and general well-being.

Notwithstanding the fact that he became a bed patient and had

proper diet and rest, his ascites became astonishingly increased. Immediately following his last treatment it became necessary to tap him almost every five or six days, and from June 22, 1919, to November 7 over 140,000 cc. of fluid were removed from this patient's abdomen in twenty-six paracenteses. A few weeks before the end of his stay in the hospital he was placed upon the cautious administration of mercury and iodide of potash, with most marked improvement in his ascites, and he was eventually discharged free of fluid in the abdomen. A recent report received from him indicates that he is now entirely well and has resumed his occupation.

His striking improvement in tone, appetite and general well-being can probably be ascribed to the effect of treatment on the syphilis existing outside of his liver. The more serious aspects of his hepatic disease were undoubtedly due to the mechanical causes resulting from a too rapid absorption of syphilitic tissue, its replacement by scar and the rapid shrinkage of the whole organ, associated with the possibility of a toxic effect of the arsenic on the remaining normal liver tissue. His ultimate recovery can without doubt be ascribed to the residual functioning portion of his liver, which fortunately escaped the ensnaring of the new-formed scar as well as the toxicity of the arsenic. I have in mind less fortunate cases, however, in which with far less clinical manifestations the increasing liver dysfunction, accompanied by ever-increasing ascites, led to a fatal issue.

Within the past month I have seen a case in an apparently healthy individual who, following two injections of neoarsphenamin, developed first the onset of apparent acute nephritis. Within two days after the onset coma developed, and this was succeeded by delirium and mania, cyanosis, slight jaundice and death after a stormy course in four days. The only clue to the hepatic pathology of this case lay in slight tenderness and rigidity over the liver region. At the autopsy the picture was that of interstitial hepatitis with beginning acute yellow atrophy and striking syphilitic changes of the heart and aorta.

As illustrative of the effect of salvarsan upon combined syphilitic cirrhosis and tuberculosis the following is cited:

CASE II.—The patient, a man, aged forty-two years, entered the hospital on April 11, 1919, complaining of jaundice and loss of weight and weakness. His syphilis dated twenty years previously, at which time he had had indifferent treatment. Two years previous to admission he became slightly jaundiced and began to lose greatly in weight and strength. On examination he was found to have an extremely large liver, very hard and irregular, giving one the impression of linear scarring on its surface. The

spleen was markedly enlarged. The heart was negative to physical examination, but there was an extensive pulmonary tuberculosis demonstrated by physical signs and by frequent sputum examinations. Following very cautious administration of neoarsphenamin, the largest dose being but 3 gm., the patient's abdomen began to fill. Paracentesis yielded about 1000 cc of fluid and was followed by rapid refilling of the abdominal cavity. Following this the patient rapidly deteriorated, became more markedly jaundiced, extremely weakened with rapid loss of weight, and exitus occurred five or six weeks later in stupor, with extreme emaciation and ever increasing anemia. At the postmortem chronic pulmonary tuberculosis, intestinal, mesenteric and peritoneal tuberculosis and miliary tuberculosis in the liver, spleen and pancreas were found. In addition to this he had a typical hepar lobatum, extensive syphilitic cirrhosis and syphilitic myocarditis and aortitis, the latter two not suspected during life. With the combined picture of extensive tuberculosis it is perhaps difficult to say in this case that the outcome would have been different had the treatment been more conservative. I am impressed, however, from a rather large experience with cases in which tuberculosis and syphilis are combined, that neither is markedly benefited by an energetic treatment employing the use of the salvarsan derivatives.

In the absence of laboratory data giving us a clue as to the functional capacity of the normal and diseased liver it seems injudicious to employ in the treatment of any form of syphilitic disease any form of therapy in which the ultimate process of the disease is anticipated, so to speak, by the effect of the treatment. A gradual resorption seems to result in a better functioning organ than follows a rapid absorption and disintegration of the diseased processes. Treatment, therefore, leading to the former would seem to be more desirable and a more rational course to pursue. I believe that salvarsan has no place in the treatment of liver disease. That it can, in certain cases, produce brilliant results, and this must be admitted, is due not to the treatment but rather in spite of it and speaks for the functional reserve of the diseased organ in the particular case. Unfortunately, however, this reserve cannot be estimated. The dictum "Treat intensively and intelligently" in syphilitic disease requires, I believe, modification when the disease presents itself with predominant findings in the liver. The intelligent handling of such a case consists not in the intensive form of treatment but in a more conservative plan, remembering the mechanical processes which might prevent a happy result and with due regard to as yet immeasurable physiologic functioning.

Syphilis, as it affects the heart, has fully as diversified a group

of pathologic pictures as occurs in the liver. As in the latter organ, however, the pictures represent different phases of the same rather than different conditions. Syphilitic myocarditis, for example, viewed pathologically, may be the result of diffuse interstitial infiltration, the disintegration and absorption of multiple minute gummas, degenerative changes near the terminals of the coronary arterioles, and muscle degeneration and replacement following obstruction or obliteration of the minute coronary vessels (myelomalacia).

Clinically, however, these varied pathologic processes present themselves as more or less severe grades of myocardial disease. Quite apart from these are the various pathologic findings in and about the base of the aorta and the aortic ring as well as those on the aortic flaps, giving the clinical picture of varying degrees of aortitis and aortic regurgitation. Coronary involvement, a still third pathologic and clinical picture, is probably so universally associated with myocardial disease that its clinical syndrome may be regarded in the symptom-complex of myocarditis. Endocardial changes involving the other valve cusps have been described, but are of such rare occurrence that, viewed from the standpoint of frequency, they may be disregarded here. As Harlow Brooks has properly pointed out, the regular, almost universal association of myocardial disease with aortic aneurysm in any form, and aortitis, brings these two conditions into a prominent place in the consideration of cardiac syphilis. Broadly speaking, therefore, clinical syphilis of the heart resolves itself into a consideration of the symptoms dependent upon myocarditis, aortic regurgitation, aortic aneurysm, syphilitic aortitis and coronary disease. It is highly probably that none of these conditions exists alone. Disease of the heart muscle may be said to be almost concomitant sooner or later with all of the aforementioned. As Brooks and others have properly brought out, the treatment, of the syphilitic heart resolves itself into two distinct factors; the syphilitic infection on the one hand and the cardiac defect on the other. These two completely distinct problems suggest at once that the proper management of such cases necessitates a knowledge on the one hand of the physiologic pathology of the heart and its treatment and on the other hand a broad comprehensive knowledge of the systemic disease. Herein, I believe, lies the explanation of the fact that today medical men are not as well equipped for, nor are giving as intelligent treatment to such cases as were their predecessors of two or three decades ago. Today not only has the periphery of our knowledge concerning syphilis been tremendously extended, necessitating the development of specially trained men in this disease, but the field of internal medicine has reached far into the realm of biochemistry and physiologic pathology. The inevitable result has been that the syphilologist, highly specialized but



lacking modern diagnostic methods of cardiac disease, treats the cases from the standpoint of the general infection, and too little attention is paid to the predominating dysfunction, namely, the diseased heart. Viewed from the other side, the internist, fully equipped with modern methods of cardiac investigation, naturally finds his chief interest in the predominating feature, namely, the diseased heart, and the extensive associated constitutional features of the case are oftentimes slighted in its treatment.

Surely a happy medium suggests itself for the correction of this natural tendency to error. The cases should be studied and treated from the standpoint, first, of the disease, and secondly, from the cardiac defect. In hospitals the ideal can be achieved when the case can have the benefit of the combined efforts of those properly equipped.

It is entirely apart from my purpose, and I am unequipped by training, to discuss the treatment of the cardiac defect in a given case.

From a rather extensive experience, however, in the management of such cases as have been described above, in collaboration with those admirably equipped to treat the cardiac defect, I have reached some very definite conclusions as to what constitutes the intelligent treatment of cases of cardiac syphilis.

My experience with salvarsan in these cases dates almost from the time of the introduction of the drug, notwithstanding the instructions which were sent out with the early packages, that cardiac disease constituted a contraindication. As I stated before I believe this fundamental error is largely practised, and few cases of syphilis are, indeed, denied at some time during their course the benefits which might be derived from the intravenous administration of salvarsan. Indeed so universal has this become that patients actually demand that form of treatment and view with suspicion any tendency to withhold it from them.

Even with due regard to the warnings concerning the contraindication of the drug, many cases of unsuspected non-symptomatic cardiac syphilis receive salvarsan; notably as is true of the very early cases of myocarditis in which the symptoms only become manifest after the treatment. It must be recalled at this point that actual cardiac syphilis in the very early months of the infection, coincident, indeed, with the exanthem, may be present either without any symptoms or with such slight clinical findings as arrhythmia and tachycardia. This last group of cases, however, probably does not present the serious problem that the later ones, in which the cardiac defect is the predominating feature of the case do, and brilliant results perhaps may be achieved in these cases with the intensive form of treatment. I have in mind, however, one case in which such treatment resulted in heart-block and in a marked accentuation of early suggestive features, so that

well-developed myocardial disease resulted in the first year of the infection.

In the early forms of myocardial disease also, and in many cases of aortic regurgitation, both compensated and decompensated, I have seen extraordinarily happy results from the use of the intensive administration of intravenous arsenic medication. As in syphilis of the liver, however, it is impossible to say in a given group of cases just exactly how an individual may react. Thus it has been my unfortunate but instructive experience to note in cases in which a happy result might be expected, intravenous medication has resulted in decompensation or acute dilatation and failure in the myocardial and aortic groups. Two cases of aneurysm in my experience have ruptured, and numerous cases of aortitis and of coronary disease have become unfortunately worse in regard to the cardiac aspect of their condition.

It is not difficult, I think, to find the source of the explanation for these unfortunate accidents. Taking the group of myocardial cases and discussing them now solely from the standpoint of syphilis, I have been impressed with the fact that these hearts untreated are frequently better functioning organs than when subjected to violent intensive therapy. There is at least some reason for believing that mechanical causes may explain this. The syphilitic infiltrates, particularly in the more diffuse form, while they unquestionably materially weaken muscle tone and function, have, as is well known, a certain degree of elasticity. Their rapid replacement or disintegration may lead to actual gaps and to such a rapid fibrosis that many otherwise normal heart-muscle cells disintegrate or are snared off in the cicatrizing process, and the result is further embarrassment, most often manifested by acute dilatation. Compensatory hypertrophy is, perhaps, nowhere seen so admirably as in the heart muscle. A compensatory hypertrophy, however, requires time, and means the slow absorption of diseased process and the slow recuperation of non-diseased muscle fibers. This, I believe, can be achieved, and is when the syphilitic heart is treated from the standpoint of its syphilis, at least slowly, and due attention is paid to it from the side of the defect. Not only may it be stated that the intensive treatment of the syphilitic heart is injudicious because of mechanical reasons, but such treatment is, indeed, at entire variance with what might properly be regarded as the effort to keep and enhance a cardiac reserve, which is the aim of the treatment directed to the defect alone. Another factor, at least of some possible bearing in producing acute failure, is the introduction into the blood stream of a not inconsiderable amount of fluid. This applies, of course, to preparations of the so-called "old salvarsan" derivatives, which necessitate the introduction of 100 cc or more of fluid.

It has been possible for me, in individual cases in which for

other reasons I have withheld salvarsan and its derivatives and employed more conservative forms of treatment, as well as in groups of cases in which I intentionally withheld the drug, to compare such groups with those treated more intensively. In both types of cases I have had the benefit of expert advice on the part of my associates in internal medicine who have treated the cases with me from the standpoint of the cardiac defect. In not a single case that I can recall of either aortitis, myocarditis or aneurysmal disease can it be stated that any untoward accident happened immediately following the institution of the treatment. In fact the reverse may be said to have been the general rule. Improvement, slow to be sure, almost invariably took place. On the other hand it must be stated that the improvement in the patient's general condition was not so striking in cases treated more conservatively, for example, with mercury and iodide. It has been a not infrequent occurrence for patients treated intensively to have an immediate betterment of their general condition, a better color and a feeling of general well-being. This, in every case, I believe, is due to the effect of the treatment upon foci elsewhere, which have been dispersed, and to a general effect upon the circulation. Such a change is not so apt to occur when iodide and mercury are given—at least the change, if it does occur, is usually later, and particularly after the drugs have been withdrawn.

The remarkable improvement in general following the arsenic treatment has often been followed in some cases by a most rapid deterioration, with evidences of accentuation of the original cardiac defect. Here one can only surmise at two possible explanations, both of which are probably factors: First, that the syphilitic products have been too rapidly replaced by scar tissue, or, second, that their rapid disintegration has produced a chemical change deleterious in its effect on the local lesion.

Here, therefore, as in liver syphilis, we are confronted with the remarkable paradox that the patient gets well or better of his syphilis, and may die as the result of the dispersion of his syphilitic cardiac lesion.

I should like briefly to summarize a few cases illustrative of the above conditions:

**CASE I.—*Syphilitic Aortitis.*** The patient, a man, aged forty-four years, entered the hospital on March 23, 1920, having been transferred from the department of medicine with a diagnosis of syphilitic aortitis. He denied knowledge of syphilis. His present trouble manifested itself as shortness of breath two years previous to admission. This became more marked until, on admission, he could not lie down for more than an hour at a time, nor could he give himself the slightest exertion without developing a marked

dyspnea. In addition he had considerable palpitation and some precordial pain. The clinical findings were those of aortitis and typical regurgitation. The patient received two injections of small doses of neoarsphenamin, only 2 gm. to which he immediately reacted with marked improvement. His symptoms and pains disappeared, his dyspnea, while present, was markedly less, and in a short time he was dismissed from the hospital for observation. Within a very brief time the patient returned completely decompensated, and it was only with the greatest difficulty that his reserve was brought up to such a point that he could again leave the hospital. His second respite was even shorter, and he has returned twice since, both of which times he was in so desperate a condition that it was believed he could not recover. At the present writing he is still living but without any reserve, and practically bedfast.

CASE II.—*Tabes Dorsalis, Aortitis, Aneurysm of the Arch, Both Unsuspected.* The patient, aged forty-six years, entered the hospital for treatment for syphilis. His infection dated back some twenty-four years, at which time he had had indifferent treatment. His present trouble began four years ago with failure of eyesight and pains. On examination he was found to have a typical tabes dorsalis, with all the classical findings. This patient received but two injections of arsphenamin, 3 gm. and four and five-tenths respectively. The second injection was followed by severe headache and attacks of dizziness as well as numbness and cold sweat. He became very cyanotic and within a few days was bedfast. At this time the first suggestion of a cardiac defect manifested itself in marked arrhythmia, weakness of the pulse, general asthenia and cyanosis and signs of cardiac dilatation. He continued in this condition for about three weeks and died suddenly in bed during the night. At the post mortem he was found to have aortitis, aneurysm, myocarditis and syphilis of the cord and brain.

This case I believe to be extremely interesting and valuable, as showing the regular association of cardiovascular and other forms of visceral syphilis, with the predominant findings those referring to the nervous system. I have seen frequent examples of this, and their occasional occurrence has made me more cautious in the use of intensive intravenous medication in cases of neuro-syphilis until I have been completely satisfied and have been assured by my internist colleagues that such patients are free, or apparently so, from evident cardiovascular disease.

CASE III.—*Syphilitic Aortitis and Myocarditis.* The patient, aged forty-four years, entered the hospital, having been referred by the department of internal medicine with a diagnosis of old syphilis and aortitis. His infection dated twelve years previous

to his admission, and treatment had at that time been indifferent. Two years previous to admission he noticed shortness of breath, weakness, dizziness and difficulty in walking. These symptoms were accompanied by sharp pains in the right side of his chest. The clinical findings were those of aortitis and regurgitation, well compensated, otherwise negative. This patient received seven injections of neoarsphenamin, the largest being only 3 gm. and the smallest. 1+. These injections were decidedly small, as I had begun to feel when he was treated that maximum dosage must be avoided in these cases. Following his injections the patient developed typical attacks of angina pectoris, these occurring very frequently. They were associated with cyanosis, collapse and syncope, so that it was feared that he might die any time during the attack. During the patient's stay in the hospital, some eight weeks, he was completely bedfast. Only after all medication had ceased and the strictest attention was paid to the cardiac defect as such did he show any sign of improvement. Under iodine and mercury, which were administered during the latter part of his stay, he gradually improved, so that the attacks finally completely ceased, his dyspnea disappeared and he was able to be discharged from the hospital.

These cases are but a few of many which I have seen, both in the hospital and private practice, in which the result, frequently fatal, more often deleterious, could justifiably, I think, be ascribed to the type of the treatment employed.

I am a most ardent advocate of the use of arsphenamin in the treatment of syphilis. However, notwithstanding the fact that brilliant results may sometimes be achieved in cases of severe visceral disease, I am of the opinion that it should not be used as a routine measure in the treatment of cardiac and hepatic syphilis. When indicated in these two conditions it may be used with reasonable safety in those cases which have responded to a previous administration of mercury and iodide. The great difficulty and the necessity for taking a positive stand lies, I believe, in our inability to properly estimate the new case from the standpoint of prognosis when it is first seen. With everything in its favor apparently, from the extent of the lesion, the shortness of its duration and the general well-being of the patient, a case of cardiovascular or hepatic syphilis may well turn out to be one with serious or even fatal sequelæ. The converse, of course, must be admitted, that cases with the most serious aspects from the standpoint of the extent of lesions and general condition of the patient may react favorably to intensive treatment.

In mercury and iodide we have two drugs admirably suited for the treatment of cardiovascular and hepatic as well as other forms of visceral syphilis. Their action is slow, and this, I believe,

is desirable. In all cases their use should be combined with the intelligent treatment of the diseased heart, and this can only be done in collaboration with the internist. On his part the internist may find useful in the management of such cases the very special knowledge which the syphilologist has of the various salts of mercury, their different uses in different types of individuals, the advantage of frequent change and more particularly the management of the constitutional side of the infection.

In the employment of newer and more potent arsenic preparations, which are constantly being introduced, I believe it is safe to predict that even greater disaster and more frequent fatality may occur when these drugs are used in the treatment of the visceral forms of the disease. The syphilized liver and heart, in whatever stage of the disease, from clinical experience at least, seem to do better when the process of repair is slow and when no great strain is placed upon their normal functioning activities.

### ACUTE LUNG ABSCESS TREATED BY THERAPEUTIC PNEUMOTHORAX.

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DETROIT.

THE danger and the high mortality of surgical drainage of pulmonary abscess lend importance to the discussion of any method which will improve our results in these cases. It has seemed worth while, therefore, to report the following experiences with the hope that as case-records accumulate we shall be able to steer a safe course in the treatment of acute pulmonary abscess. The cases here reported are all non-tuberculous.

**Nomenclature.** The term lung abscess is a somewhat ill-defined expression for intrapulmonary pus. It may be diffuse or circumscribed, acute or chronic, gangrenous or not. It is frequently an extension from a purulent process in the neighboring tissues, as empyema, lateral or interlobar. Its etiology has many items. For the purpose of this paper, pus in the lung, the result of burrowing from an interlobar empyema, ultimately reaching a bronchus, is called a lung abscess. There seems to be no single pathologic term in English which will describe this condition. Other processes producing free pus in the lung are included under this term, the etiologic items being mentioned in the separate case reports. This explanatory paragraph is inserted because of the lack of satisfactory nomenclature for these conditions, causing confusion in the mind of the reader.